

WHAT IS CLAIMED IS:

1. A method for multi-objective portfolio optimization for use in investment decisions based on competing objectives and a plurality of constraints constituting a portfolio problem, the method sequentially comprising:
 - generating a non-dominated solution set in a space;
 - applying a first set of user-specified constraints to reduce the solutions in the non-dominated solution set to a solution subset; and
 - executing a series of local tradeoffs on the solution subset to result in a resulting solution subset, the local tradeoffs being performed in a lower dimension performance space as compared to the space, and the solution subset being used in investment decisioning.
2. The method of claim 1, wherein the non-dominated solution set is an efficient frontier.
3. The method of claim 2, wherein the efficient frontier is generated using an evolutionary algorithm.
4. The method of claim 2, wherein the efficient frontier is generated using optimization processing.
5. The method of claim 1, wherein the first set of user-specified constraints is defined by limits on performance metrics.
6. The method of claim 5, wherein the performance metrics include risk and return.
7. The method of claim 5, wherein the first set of user-specified independent constraints include imposing a lower limit on return and an upper limit on risk.

8. The method of claim 5, wherein the first set of user-specified independent constraints include imposing a first range on return and a second range on risk.

9. The method of claim 1, wherein the executing a series of local tradeoffs on the solution subset to result in a resulting solution subset includes:

identifying a most important tradeoff and applying that most important tradeoff to the solution subset, the most important tradeoff being between a subset of performance metrics; and thereafter

identifying a second most important tradeoff and applying that second most important tradeoff to the solution subset, the second most important tradeoff being between a second subset of performance metrics.

10. The method of claim 9, wherein the (1) identifying a most important tradeoff and applying that most important tradeoff to the solution subset, and (2) identifying a second most important tradeoff and applying that second most important tradeoff to the solution subset, constitutes a local tradeoff process, the method further including:

determining, by a user, if any further trade-offs are desired; and

continuing the local trade-off process until no further trade-offs are desired.

11. The method of claim 9, wherein the first subset of performance metrics is selected from the group of risk-return, risk-risk, and return-return metrics.

12. The method of claim 1, wherein the executing a series of local tradeoffs on the solution subset to result in a resulting solution subset includes:

identifying a most important tradeoff and applying that most important tradeoff to the solution subset, the most important tradeoff being between a first metric and a second metric; and thereafter

identifying a second most important tradeoff and applying that second most important tradeoff to the solution subset, the second most important tradeoff being between a third metric and a fourth metric.

13. The method of claim 1, wherein the method further includes applying, on the resulting solution subset, additional constraints by imposing preferences.

14. The method of claim 13, wherein the preferences are represented by relative weights on performance metrics.

15. The method of claim 13, wherein the preferences are represented by relative weights on performance configuration metrics.

16. The method of claim 1, wherein the executing the series of local tradeoffs is performed in performance configuration space.

17. The method of claim 16, wherein after executing the series of local tradeoffs in performance configuration space on the solution subset to result in the resulting solution subset, the method further includes:

applying portfolio configuration metrics based on the asset allocation in a portfolio; and

comparing portfolio configuration metrics between portfolios.

18. The method of claim 17, wherein the portfolio configuration metrics of a portfolio is calculated in an absolute term with relation to the existing portfolio.

19. The method of claim 17, wherein the portfolio configuration metrics of a portfolio is calculated in a relative term with relation to the existing portfolio.

20. The method of claim 17, wherein the comparing includes determining the required transaction to transform the asset allocation of an asset class in the currently existing portfolio to an asset allocation of the asset class in each of the portfolios in the resulting solution subset.

21. The method of claim 1, wherein the user-specified constraints are one of independent and dependent constraints.

22. The method of claim 1, further including using a visualization tool.

23. The method of claim 1, wherein the first set of user-specified constraints to reduce the solutions in the non-dominated solution set to a solution subset are based on performance metrics.

24. The method of claim 23, the method, after executing a series of local tradeoffs on the solution subset to result in a resulting solution subset, further including:
applying further user specified constraints.

25. The method of claim 24, wherein the further user specified constraints are based on portfolio configuration metrics.

26. A system for multi-objective portfolio optimization for use in investment decisions based on competing objectives and a plurality of constraints constituting a portfolio problem, the system comprising:

a solution set generation portion that generates a non-dominated solution set;

an initial constraint portion that applies a first set of user-specified constraints to reduce the solutions in the non-dominated solution set to a solution subset; and

a trade-off processing portion that executes a series of local tradeoffs on the solution subset to result in a resulting solution subset, the resulting solution subset being used in investment decisioning.

27. The system of claim 26, wherein the non-dominated solution set is an efficient frontier.

28. The system of claim 26, wherein the first set of user-specified constraints is defined by limits on performance configuration metrics.

29. The system of claim 28, wherein the performance configuration metrics include risk and return.

30. The system of claim 26, wherein the trade-off processing portion:
identifies a most important tradeoff and applies that most important tradeoff to the solution subset, the most important tradeoff being between a subset of performance metrics; and thereafter

identifies a second most important tradeoff and applies that second most important tradeoff to the solution subset, the second most important tradeoff being between a second subset of performance configuration metrics.

31. The system of claim 26, wherein the executing the series of local tradeoffs is performed in performance configuration space.

32. The system of claim 31 wherein the system includes a subsequent constraint portion, and after executing the series of local tradeoffs in performance metric space on the solution subset to result in the resulting solution subset, the subsequent constraint portion:

applies further user specified constraints.

33. The system of claim 32, wherein the further user specified constraints are based on structure metrics.

34. A computer readable medium for multi-objective portfolio optimization for use in investment decisions based on competing objectives and a plurality of constraints constituting a portfolio problem, the computer readable medium comprising:

a first portion that generates a non-dominated solution set;

a second portion that applies a first set of user-specified constraints to reduce the solutions in the non-dominated solution set to a solution subset;

a third portion that executes a series of local tradeoffs on the solution subset to result in a resulting solution subset; and

a fourth portion, and after executing the series of local tradeoffs in performance metric space on the solution subset to result in the resulting solution subset, the fourth portion applies further user specified constraints, the resulting solution subset being used in investment decisioning.

35. A method for multi-objective portfolio optimization for use in investment decisions based on competing objectives and a plurality of constraints constituting a portfolio problem, the method sequentially comprising:

generating a non-dominated solution set in a space;

applying a first set of user-specified constraints to reduce the solutions in the non-dominated solution set to a solution subset; and

executing a series of local tradeoffs on the solution subset to result in a resulting solution subset, the local tradeoffs being performed in a lower dimension performance

space as compared to the space, and the solution subset being used in investment decisioning; and

wherein the executing the series of local tradeoffs is performed in performance configuration space; and

wherein after executing the series of local tradeoffs in performance configuration space on the solution subset to result in the resulting solution subset, the method further includes:

applying portfolio configuration metrics based on the asset allocation in a portfolio; and

comparing portfolio configuration metrics between portfolios.